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Straton's Tower, Herod's Harbour, and Roman and Byzantine Caesarea

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Isotopic and artistic analysis of Corinthian marble capitals from Caesarea: a case study

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The architectural fashions prevailing at Caesarea conformed to those prevailing in the broader late Hellenistic and Roman world. With its harbour, temple, storerooms, aqueducts, theatre, amphitheatre, hippodrome, and other public buildings, Caesarea ranked among the leading cities of the Greco-Roman Mediterranean. In a recent study of marble capitals from Israel, 108 of 180 examples came from Caesarea (Fischer 1990). The present interdisciplinary article examines the Corinthian marble capitals from Caesarea according to the sources of the marble and the artistic influences or style.

Excavations have shown that two kinds of stone were used at Caesarea for both structural and decorative purposes: local sandstone (*kurkar*) and imported marble. Unlike other Palestinian sites (e.g. Scythopolis), at Caesarea this distinction has a certain chronological value. Thus, Herodian Caesarea used *kurkar*, the marble slabs used to decorate the orchestra of the theatre being an important exception (Albricci 1965). At least from Hadrian and the Antonines onwards, Caesarea became a city decorated with marble; at the same period, marble sarcophagi and sculptures began to be imported to the city (Gersht 1987). Palestine lacks its own marble, which must therefore be imported (Fischer 1988). Caesarea benefitted from its participation in the empire-wide system of marble quarrying and trade, and indeed seems to have played an important rôle in the introduction of marble to the country because of its harbour and its good links with the rest of the country through a well developed road-system.

Because of their numbers at Caesarea and their artistic features, capitals provide a good body of evidence to answer the question of the sources of marble used in the city. We are particularly concerned here with the question whether a differentiated art-historical typology of the marble capitals can be related to the scientific evidence for the sources of marble used, and, in the event of a positive answer to the first question, whether artistic designs can be attributed to workshops operating at source.

Determining marble origin

Several analytical techniques were used. Of prime importance is the carbon and oxygen stable isotopes signature. This is currently the best method for provenancing white marble. It is based upon a comprehensive data-base that includes the stable isotope composition of marble samples from major Roman quarries (Herz 1987). We have assigned provenance for each capital based primarily upon its stable isotope composition (fig.1). Marble mineralogy (Mn content) and petrography were employed to support the assignation (Table 1). (For further details and the analytical procedures used, see Pearl and Magaritz 1991.)

TABLE 1: THE ARTISTIC/STYLISTIC TYPE, ISOTOPIC AND CHEMICAL COMPOSITION, AND ASSIGNED ORIGIN FOR 58 CORINTHIAN CAPITALS FROM CAESAREA.

Sample	*Type*	*δ13C*	*δ18O*	*d d*	*Mn (ppm)*	*Origin*
1	I	2.66	-2.32	0	3	Marmara
2	I	2.96	-5.63	0	3	Naxos
3	I	3.28	-1.84			Marmara
4	I	2.94	-1.02		3	Marmara
5	IB	2.82	-2.41	0	9	Marmara
6	IBD	3.83	-3.66	tr.		Paros
7	IE	2.26	-2.96	tr.		Afyon/Aphrodisias
8	II	3.39	-1.68			Marmara
9	IIA	2.48	-1.78			Marmara
10	IIB	1.68	-2.92	0		Afyon/Aphrodisias
11	IIC	2.24	-2.72		34	Afyon/Aphrodisias
12	IID	1.53	-3.72		26	Afyon/Aphrodisias

Sample	*Type*	*δ13C*	*δ18O*	*d d*	*Mn (ppm)*	*Origin*
13	IID	3.47	-2.14	0	35	Denizli?
14	IIE	2.34	-1.58			Marmara
15	IIIAc	3.32	-2.59	0		Marmara
16	IIIA	2.02	-4.02			Afyon/Aphrodisias
17	IIIA	1.43	-3.65		36	Afyon/Aphrodisias
18	IIIB	3.78	-5.99	0	195	Sardis
19	IIIDc	3.19	-1.88			Marmara
20	IIIDc	3.75	-3.88	tr.		Paros
21	IIIDc	3.87	-0.77	<5		Marmara
22	IIIDc	3.49	-1.75	tr.		Marmara
23	IIIDc	3.26	-1.92	0		Marmara
24	IIIDc	3.50	-1.82	0	13	Marmara
25	IIIDc	3.15	-2.64			Marmara
26	IIIDc	3.24	-1.86	0	7	Marmara
27	IIIDc	3.33	-2.18			Marmara
28	IIIDc	3.23	-2.01	0		Marmara
29	IIIED	3.23	-2.15			Marmara
30	IIIED	3.41	-2.00			Marmara
31	IIIED	3.36	-1.92			Marmara
32	IIIED	3.37	-2.31	0	13	Marmara
33	IIIED	3.32	-1.75			Marmara
34	IIIED	3.45	-1.83	tr.	14	Marmara
35	IIIED	3.36	-1.24			Marmara
36	IIIED	3.37	-1.84	0	16	Marmara
37	IVA	3.86	-1.63	0	<1	Marmara
38	IVB	2.26	-2.69		25	Marmara/Mylasa
39	IVB	1.87	-2.84		22	Afyon/Aphrodisias
40	IVB	2.41	-4.00	0		Afyon/Mylasa
41	IVB	2.26	-4.50	0		Afyon
42	IVB	1.08	-2.78			Afyon/Ephesos
43	IVC	1.42	-3.83	0	26	Afyon
44	IVC	2.53	-2.86		6	Marmara/Mylasa
45	IVC	2.81	-3.86	0	2	Mylasa
46	IVC	0.51	-3.62	0		Aphrodisias/Ephesos
47	IVC	2.12	-4.12	0		Afyon/Aphrodisias
48	IVC	2.00	-1.98	0		Marmara
49	VIE	2.06	-7.46	0	18	Naxos
50	VIE	2.59	-0.51		15	Marmara
51	VIE	2.79	-1.21	0		Marmara
52	VII	2.63	-1.40	0	5	Marmara
53	VII	2.01	-0.93	0	5	Marmara/Iasos
54	VII	2.73	-2.75		6	Marmara
55	VII	2.58	-1.24		3	Marmara
56	VII	3.15	-2.84	0		Marmara
57	VII	2.66	-2.37			Marmara
58	VII	1.91	-1.71			Marmara/Iasos

The isotopic composition is given in a similar way to fig.1.
The weight percent content of dolomite ($CaMg(CO_3)_2$) relative to calcite ($CaCO_3$) is given under dd.
Mn content is given in parts per million (ppm).

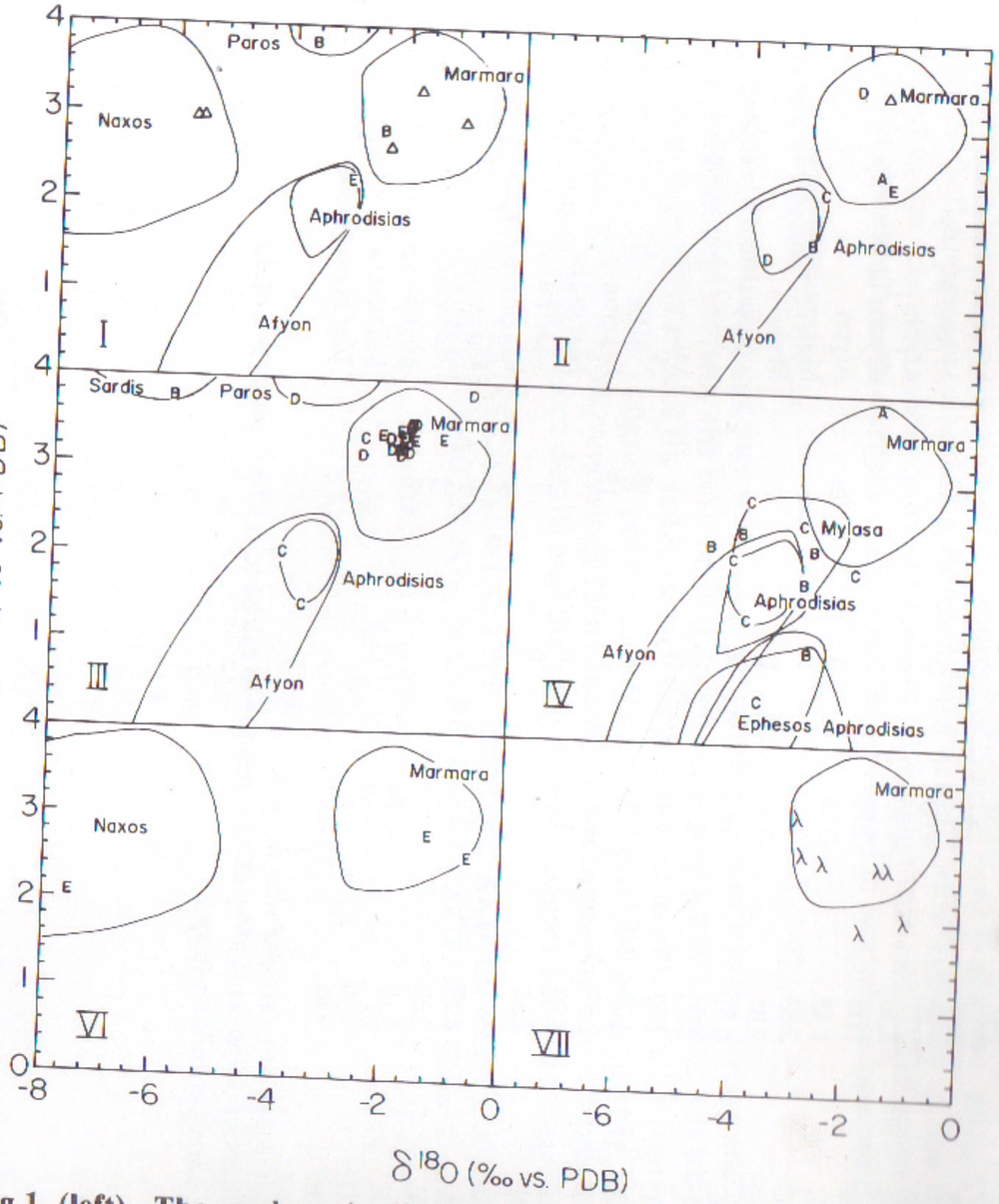

Fig.2. Capital type I.

Fig.1 (left). The carbon (ordinate) and oxygen (abscissa) stable isotope composition of the 58 Corinthian capitals from Caesarea, and their probable origin.

The figure is divided into 6 parts according to types I-VII, and the specific features A-E and a-c are given for each capital.
Triangles represent capitals where specific artistic motifs could not be recognized.
The isotopic composition is given as the deviation in ‰ (per mills) between the isotopic composition of the sample and that of the PDB standard. It is designated by $\delta^{13}C$ for carbon and $\delta^{18}O$ for oxygen.
The isotopic field for each quarry is drawn within a line and is based on the data base of Herz (1987). For further details see Pearl and Magaritz 1991.

Artistic and stylistic divisions of the Caesarea capitals

The capitals were divided into 7 major types by their design, each of which was subdivided into subtypes and groups according to their decorative details (Fischer 1990, 37-40 and figs.1-2). A similar typological division may be noted for Corinthian capitals found in Asia Minor (the area that is presumed to have furnished most marble to the eastern Mediterranean), in Tripolitania, and at Ostia (for typologies, see Heilmeyer 1970; Naumann and Kantar 1950; Pensabene 1973; cf. Fischer 1990, 39). The division into 7 major types (I-VII) is based upon differences in position and relationship between the two ranges of acanthus leaves. A further scale of stylistic characteristics (A-E) is then added to refer to the decorative design of the helices, volutes, calyces, and adjacent leaves and palmettes etc. Another criterion (a, b, c) relates to the design of the tips of the acanthus leaves in the upper range where they meet (see Fischer 1990, 37-40). The 7 types are as follows:

I. isolated carved acanthus leaves (fig.2; Fischer 1990, no.50)

II. slightly touching acanthus leaves, especially in the lower range (fig.3; Fischer 1990, no.58)

III. ranges of acanthus leaves touching each other (fig.4 type III Dc; fig.5 type III ED; Fischer 1990, no.93 and no.128).

IV. a 'net' is created by the covering acanthus leaves (fig.6; Fischer 1990, no.153).

V-VI. these two types represent attempts to combine features of types I-III in new designs (fig.7; Fischer 1990, no.205).

VII. a complete break from the principles governing types I-VI. This type does not have helices of any kind (a notable feature of Corinthian capitals of the period) (fig.8; Fischer 1990,no.213).

Decorative designs:

A. a regular kind of calyx.

B-C refer to the existence of a central leaf attached to the calathus, which rises behind the upper row of acanthus leaves. **B** refers to a regular leaf; **C** refers to a palmette.

D. the helices and the inner leaves of the calices meet under the abacus.

E. a special design of the helices, such as heart-shaped helices, or helices carved like a floral medallion or like a natural leaf.

Fig.3. Capital type II.

Fig.4. Capital type III Dc.

Fig.5. Capital type III Ed.

Fig.6. Capital type IV.

Fig.7. Capital type V-VI.

Fig.8. Capital type VII.

The combination between design (I-VII) and decoration (A-E and a-c) permits capitals to be arranged in combined types: e.g. IIAc, IIIED. See figs.2-8.

All of the types described above belong to *c.*150-250. Some specific types may be dated more closely:
— types I-II may be dated to the middle of the 2nd c.;
— types III-IV to the last quarter of the 2nd c. up to *c.*220;
— type V to the Severan period (*c.*190-230);
— types VI-VII to the middle and second half of the 3rd c.
A better chronological framework will come when capitals of similar design and geochemical characteristics are found to derive from particular buildings which are well dated archaeologically, after they have been properly published.

For the present study 58 Corinthian capitals belonging to 6 types were examined (type V is scarcely present at the site). The results are given in Table 1, where the suggested origin of each capital is given. This is based on fig.1.

Type I

Seven capitals were studied (fig.2; Fischer 1990, no.50). They are of different origins and belong to different subtypes. Two (C.2, C.6) stand out as coming from Naxos and Paros respectively. The remainder are from Marmara and Afyon/Aphrodisias. Type I is found at the Trajaneum at Pergamon where the foundations for the Pergamene-Ephesian school of decoration were laid. It was quite popular outside Asia Minor (e.g. Athens, Rome; cf. Fischer 1990, 40).

Type II

Seven capitals were studied (fig.3; Fischer 1990, no.58). They are of different origins. The marbles are divided almost equally between Marmara and Afyon/Aphrodisias. Artistic/stylistic parallels point to Ephesos, but there they already represent early examples of interaction between Ephesos and the newly-created workshop at Aphrodisias. Since some of the capitals of this type are of marble from Afyon/Aphrodisias, it may point to a connection between the quarry and the designers who created the capitals. Marmara became a larger production centre, with its marble reaching other cities where objects were carved also in local workshops using both marble and artistic designs drawn from Aphrodisias.

Type III

This is the largest group of capitals from Caesarea, with 22 examples studied. The most popular subtypes are III Dc (fig.4; Fischer 1990, no.93) and III E-D (fig.5; Fischer 1990, no.128). Capitals with the decoration of subtype III Dc comprise the largest group of marble capitals from Roman Palestine (58 recorded, 28 of them from Caesarea; Fischer 1990, 44-45). Eleven of these capitals were examined here. The isotopic composition of all but two is so similar that we may attribute them to the same outcrop in the Marmara quarry (Pearl and Magaritz 1991). Capitals of subtype III E-D have a similar isotopic composition, and are a variation of type III Dc, being found exclusively at Caesarea (Fischer 1990, 45-46). Thus, capitals of subtypes III Dc and III E-D form a group. Their isotopic composition is similar, suggesting they derive from the same outcrop. From a stylistic point of view, capitals of both subtypes belong to the developed stage of the Aphrodisian school of architectural decoration (popular in the 2nd-3rd c.). They recall the features of capitals found especially in the large centres of western Asia Minor such as Miletos, Ephesos and Perge where the impact of the Aphrodisian school is easily visible. The fact that they were made of marble from Marmara is not surprising since the Proconnesian quarries became the main marble supplier of many centres from the 1st c. A.D. onwards. Many centres probably found it easier to procure marble from Proconnesus even if there were quarries existing locally. Recent work on Marmara island has brought to light several large-scale quarries and workshops for sarcophagi and architectural pieces. From the quarry and harbour complex at Saraylar many half-finished pieces were shipped. N. Asgari has shown that not only sarcophagi but also architectural pieces and statues could be exported in semi-finished form from Proconnesos (Asgari 1978, 476, 479, pl.141, figs.13-14; cf. also Asgari 1988).

The capitals of subtypes III Dc and III E-D from Caesarea probably derive from the same architectural complex. Isotopic and stylistic uniformity, as in the case of the capitals of these subtypes, may be used to link objects of uncertain provenance to a particular building. Capitals of subtype III E-D, found near the theatre, probably decorated that monument in the Severan period, and we may attribute capitals of subtype III E-D to the same building. The capitals of these two subtypes are of three distinct but uniform sizes (Fischer 1990, Table 1, nos.76-83, compared to 84-98 or 123-32); they may therefore have been used in different parts of the *scaenae frons*. Unfortunately there is no literary or epigraphic proof for such a phase of the theatre. In Asia Minor there are several epigraphic attestations of direct links between quarries/workshops and particular buildings (Fant 1985, 661). At Scythopolis in Palestine, Pearl and Magaritz (1991) concluded, on the basis of the stable isotope analysis of 44 pieces, that direct relations existed between the Proconnesos quarry/workshop and the Scythopolis theatre. It may be cautioned that the Roman marble trade made use of intermediary agencies as evidently at Tyre (Ward-Perkins 1980) and perhaps also at Caesarea itself, so the picture may be somewhat more complicated. Evidence from the Scythopolis "monument" suggests an intermediary agency (Pearl and Magaritz 1991). That the Caesarea capitals were worked and finished according to the principles of the Aphrodisian school, though made from Proconnesian marble, may show that the Proconnesian quarries were making efforts to expand their sphere of influence over other regions (on competition between the quarries of Dokimeion and Proconnesos, see Fant 1985, 661 n.31).

Type IV

Of the 12 capitals of type IV examined (fig.6; Fischer 1990, no.153), all but two could be attributed isotopically to the Afyon/Aphrodisias quarries. Stylistically they represent the developed phase of the Aphrodisian school of architectural decoration (Fischer 1990, 46-47). For these capitals a match between the origin of the marble and the artistic sources was achieved, since the quarries of Afyon/Aphrodisias were the main marble source for the Aphrodisias architectural and sculptural workshops. In the competition between the quarries of Proconnesos and those of Afyon/Aphrodisias, and with other sites too, Afyon/Aphrodisias achieved supremacy at least in that particular region. At an earlier period even at nearby Hierapolis marble was brought in from Proconnesos, and in the late Roman and Byzantine period Proconnesos again achieved supremacy (see types VI and particularly VII). Of the 33 Palestinian capitals of type IV, 23 came from Caesarea, the others from Askalon and Scythopolis. Whereas at Scythopolis they can be linked to the theatre, at Caesarea they are not obviously related to any particular monument.

Type V

Type V is almost completely absent from Caesarea but occurs at Askalon in great numbers. Thus it seems as if there was more than one export-source for Corinthian capitals.

Type VI

The Palestinian capitals of type VI (fig.7; Fischer 1990, no.205) occur exclusively at Caesarea. Their isotopic compositions are similar and point to a single origin — Proconnesos. Type VI combines in a curious way features of other types, such as the upper part of the capital of type V and some of the lower parts of types III and IV. This combination of features occurred in many art centres where marble was used on a large scale and was then exported. The design which characterizes capitals of type VI, however, found only at Caesarea, points to regional or local attempts to create new forms. The influence of the so-called 'Syrian acanthus' on the design of the leaves of capitals of type VI is also pertinent.

Type VII

Seven capitals of type VII were examined for this study (fig.8; Fischer 1990, no.213). Like type VI, examples of type VII occur only at Caesarea. One was found in the excavations of the hippodrome (Humphrey 1975, fig.10; Fischer 1990, 54, no.221), a building probably dated to the early 3rd c. Such capitals would fit such a chronology, constituting the last phase of the development of the Corinthian design before the major changes that occurred at the end of the 3rd and beginning of the 4th c. Although belonging to different stages in the decorative evolution of the 2nd-3rd centuries, capitals of this type show some noteworthy and unusual features. The most striking is the complete absence of helices. Capi-

tals of this kind are found in other centres such as Alexandria.

The marble of the capitals examined isotopically belongs to the Proconnesian quarries (Table 1). A similar, almost identical design to type VII is found on capitals at the quarry and harbour of Saraylar on the north side of the island of Marmara (Asgari 1988, fig.12). N. Asgari attributed many of them to stage 12 of workmanship, that is, the most advanced stage before shipping. The abacus, including the flower, was left unfinished, to be completed at the destination. Stylistic and isotopic examination of capitals of type VII thus points to excellent correlation between the marble source and the artistic workmanship. The existence of such capitals in an advanced state at the Proconnesos quarries and as finished items at Caesarea shows the nature of this correlation: only a few elements remained to be finished at the destination point; the main features of the design had been determined at the quarry and its nearby workshops. This may explain the absence of the ovolo motif from the abacus of the examples in Palestine (unlike the contemporary capitals from Asia Minor) (Fischer 1990, 60).

This correlation, which seems to have taken place, represents a trend in rationalization of a large-scale industry in the Roman economy, including 'art-industry' ("*Kunstindustrie*", Riegl 1927). Imported marble capitals often bear the marks of the region of origin of the marble, but outstanding features may be added at the point of destination — for example, on a figured capital from Caesarea, of type IIA-IID (Fischer 1990, 42, no.51b), the head of a Tyche was added in the place of the abacus flower, the result of rather naive local initiative (Fischer 1991, 129-31, figs.4a-b).

In conclusion, marble was brought to Caesarea from the two main production areas of Proconnesos and Afyon/Aphrodisias. Some artistic elements common to the region of origin have been revealed, and they must be placed in the context of artistic developments in Asia Minor in the 2nd-3rd c. when the Aphrodisian school overtook its competitors at centres like Ephesos, Miletos, and Pergamon. Yet the chief marble-supplier remained the quarries of Proconnesos. Capitals made from Proconnesos marble have the same artistic and stylistic features as pieces from Ephesos or Pergamon due to the impact of Aphrodisias. At Caesarea we have shown that for some capitals there is an almost exact correlation between the source of the marble and the artistic/stylistic source. The twin interdisciplinary approach, the artistic/stylistic and the isotopic, can shed light on the place of a provincial capital in the imperial marble-quarrying industry and marble trade. It would be valuable now to examine marble capitals at Scythopolis and Askalon to compare them with those from Caesarea.

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REFERENCES

Albricci, A. 1965 "Il pavimento dipinto della conistra" in Frova 1965, 93-120

Asgari, N. 1978 "Roman and early Byzantine marble quarries of Proconnesos" in *Proceedings of the Xth International Congress of Classical Archaeology Ankara-Izmir 1973* (Ankara) 467-80

Asgari, N. 1988 "The stages of workmanship of the Corinthian capital in Proconnesos and its export form" in Herz and Waelkens (edd.) 115-25

Fant, J. Clayton 1985 "Four unfinished sarcophagus lids at Docimium and the Roman imperial quarry system in Phrygia," *AJA* 89, 655-62

Fischer, M. L. 1988 "Marble imports and local stone in architectural decoration of Roman Palestine: marble trade, techniques and artistical taste" in Herz and Waelkens (edd.) 161-70

Fischer, M. L. 1990 *Das korinthische Kapitell im alten Israel in der hellenistischen und römischen Periode* (Mainz)

Fischer, M. L. 1991 "Figured capitals in Roman Palestine. Marble imports and local stones: some aspects of 'imperial' and 'provincial' art" *ArchAnz* 119-44

Heilmeyer, W.-D. 1970 *Korinthische Normalkapitelle* (Heidelberg)

Herz, N. 1987 "Carbon and oxygen isotopic ratios: a data base for classical Greek and Roman marble," *Archaeometry* 29, 35-43

Herz, N. and Waelkens, M. (edd.) 1988, *Classical marble: geochemistry, technology, trade* (Dordrecht)

Humphrey, J. H. 1975 "Summary of the 1974 excavations in the Caesarea hippodrome" *BASOR* 218, 1-24

Naumann, R. and Kantar, S. 1950 "Die Agora von Smyrna" in *Kleinasien und Byzanz* (IstForsch 17) 69-114

Pearl, Z. and Magaritz, M. 1991 "Stable isotopes and the Roman marble trade: evidence from Scythopolis and Caesarea, Israel," *The Geochemical Society, special publication* 3, 295-303

Pensabene, P. 1973 *Scavi di Ostia* VII. *I capitelli* (Roma)

Riegl, A. 1927 *Spätrömische Kunstindustrie* (Wien)

Ward-Perkins, J. B. 1980 "Nicomedia and the marble trade," *PBSR* 48, 23-69.